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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,416	04/21/2004	Nobuhiro Nakamura	252144US-2 CONT	4529

22850 7590 06/19/2008

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EXAMINER	
GUHARAY, KARABI	
ART UNIT	**PAPER NUMBER**
2889	

NOTIFICATION DATE	DELIVERY MODE
06/19/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/828,416	NAKAMURA, NOBUHIRO	
	Examiner	Art Unit	
	Karabi Guharay	2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *RCE, filed on 5/12/2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11,14-18,21,22,26,27,36,38 and 41-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11,14-18,21,22,26,27,36,38 and 41-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/12/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/12/2008 has been entered.

Amendment, filed on 5/12/2008 has been considered and entered.

As amended, currently claims 11, 14-18, 21-22, 26, 27, 36, 38 and 41-55 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 11, 14-18, 21-22, 26, 27, 36,38, 41-47, 49-55 rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama (JP2000-243558) in view of Iyama (JP 09-138424), and further in view of Codama et al. (US 6114805).

Regarding claim 11, 14-16, 21, Nagayama teaches an organic EL (Fig 1-3 & 5) display element comprising a first conductive layer (9), a second a second conductive layer (5), made of transparent ITO, opposed to the first conductive layer 9, an insulating layer covering edge portions of the second conductive layer 5 (see paragraph 13) a driving current circuit (see paragraph 0003) connecting terminal connected electrically with the first electrode (9) via supplementary wire (16), and an organic EL layer (7) disposed between first and second conductive layer, such that the organic layer only contacts a central portion of the of a surface of the second conductive layer and does not contact the edge portions of the second conductor 5 (see Figs 6 & 8, where the edges of the anode 5 is not covered by organic EL layer 7, only the central portion of anode 5 is contacting organic EL layer 7; also see paragraph 13); wherein the supplementary layer has at least one surface layer containing Mo alloy (see paragraph 9), where the second conductive layer (5) is made of a same material (ITO) as the driving current circuit connecting terminal (15 is also made of ITO).

But Nagayama is silent about the supplemental wire (16) has a different composition from the remainder of the supplemental wire or supplemental wire comprises at least 3 layers including a layer containing Mo alloy, and a layer of Al or Al alloy formed below the Mo layer.

However, in the same field of display device, Iyama discloses wiring pattern for driving a display having a metal electrode comprising at least 3 layers (17, 18 & 19 of Fig 2f) first and third metal thin film layer made of Mo (17 & 19), a layer (18) of Al or Al alloy (second metal thin film layer) formed below the layer of Mo, on the transparent layer (16). Further Iyama teaches that such type of multilayer wiring extremely lower the occurrence rate of display defect by preventing erosion of transparent and metallic thin film electrode, (see English Abstract).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate an Al alloy layer under the Mo alloy layer as the supplemental wire on the transparent layer (15) of the Nagayama's device since this will significantly prevent erosion of transparent electrode and metal thin film.

But, the combined structure of Nagayama and Iyama fails to teach that the Mo alloy contains Nb where the content of Nb in the Mo-Nb alloy is between 10 and 20 at%. However, Codama et al. in the analogous art teach a layer of Mo alloy contains Nb (col. 8 lines 39-47; col. 8 line 30). Additionally, Codama et al. teaches incorporation of such a Mo alloy contains Nb, where content of Nb in the alloy is 10 at % (which is within the claimed range of value) improves the protection of interconnection electrode (col. 8, lines 30-50) and provide a working interconnection electrode.

Consequently, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the Mo alloy containing Nb in the auxiliary electrode of combined structure of Nagayama /Iyama, since such a modification would improve the protection of interconnection electrode and provide a working interconnection electrode as taught by Codama et al.

Regarding claim17, the combined structure of Nagayama/Iyama/Codama discloses that the first conductive layer (9) is connected to an etched surface of the first layer containing Mo-Nb alloy (see Nagayama; paragraph 13).

Regarding claim18, the combined structure of Nagayama/Iyama/Codama discloses that a portion of the first conductive layer (9) connected to the layer containing Mo-Nb is defined by an insulating film (see Nagayama; paragraph 13).

Regarding claim 22, the combined structure of Nagayama/Iyama/Codama discloses an organic EL display device and a driving circuit for driving EL element (See Nagayama; though circuit is not shown in drawing it is connected to 11 for driving the display).

Regarding claim 26, the combined structure of Nagayama/Iyama/Codama discloses an organic electroluminescent device comprising several pixels (see Nagayama; Fig 1) having several supplemental wires, however, does not disclose the number of wires, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have at least 30 supplemental wires to form a large display.

Regarding claim 27, the combined structure of Nagayama/Iyama/Codama discloses a passive matrix EL display and discloses that the electrode leading part 11 is made of high melting point metal (see Nagayama; paragraph 9), and further teaches in paragraph (Nagayama; paragraph 0003) that large current is flowing through the conductors via supplemental wire (11) so low resistance material is chosen, thus it is configured to carry a driving current of at least 50 mA of current.

Regarding claims 36, 38, the combined structure of Nagayama /Iyama/Codama teaches Mo-Nb alloy and Al alloy. Further, Codama specifically teaches that the protective layers in the interconnections should have thickness in the range of 100-500 nm in order to have optimum protection (lines 50-67 of column 8).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have layers in the range of 100-500nm, since such range of thickness of protecting layers will provide optimum protection.

Regarding claim 41, the combined structure of Nagayama/Iyama fails to disclose that the Al alloy contains Al-Nd.

However, Codama et al. in the analogous art teaches addition of transition metal such as Nb in the Al layer (col. 8 lines 39-47; col. 8 line 30). Additionally, Codama et al. teaches incorporation transition metal in the alloy improves protection property of the interconnecting of the thin film electrode (col. 8, lines 30-50).

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the Al alloy containing Nb in the auxiliary electrode of combined structure of Nagayama /Iyama, since such a modification would provide further protection of the interconnection electrode as taught by Codama et al.

Regarding claims 42-45, 49, the combined structure of Nagayama and Iyama teaches all the limitations of claim 42 (see rejection of claim 11) except for first and third layer containing Mo-V alloy.

However, Codama et al. in the analogous art teaches addition of transition metal In Mo layer (col. 8 lines 39-47; col. 8, line 30). Additionally, Codama et al. teaches incorporation transition metal in the alloy improves protection property of the interconnecting of the thin film electrode (col. 8, lines 30-50). Codama further mention some of the transition metals however, does not explicitly mention transition metal such as vanadium.

Since vanadium is a transition metal having same property as other transition metal such as Nb, or Ta, it would have been obvious to one having ordinary in the art to use one of Nb or Vanadium in the auxiliary electrode of combined structure of Nagayama /Iyama, since selection

of any art recognized equivalent material is considered within the skill of art, and further alloying Mo with such material would provide further protection of the interconnection electrode.

Regarding claim 46, the combined structure of Nagayama/Iyama/Codama discloses that the first conductive layer (9) is connected to an etched surface of the first layer containing Mo-Nb alloy (see Nagayama; paragraph 13).

Regarding claim 47, the combined structure of Nagayama/Iyama/Codama discloses that a portion of the first conductive layer (9) connected to the layer containing Mo-Nb is defined by an insulating film (see Nagayama; paragraph 13).

Regarding claim 50, the combined structure of Nagayama/Iyama/Codama discloses an organic EL display device and a driving circuit for driving EL element (See Nagayama; though circuit is not shown in drawing it is connected to 11 for driving the display).

Regarding claim 51, the combined structure of Nagayama/Iyama/Codama discloses an organic electroluminescent device comprising several pixels (see Nagayama ; Fig 1) having several supplemental wires, however, does not disclose the number of wires, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have at least 30 supplemental wires to form a large display.

Regarding claim 52, the combined structure of Nagayama/Iyama/Codama discloses a passive matrix EL display and discloses that the electrode leading part 11 is made of high melting point metal (see Nagayama; paragraph 9), and further teaches in paragraph (Nagayama; paragraph 0003) that large current is flowing through the conductors via supplemental wire (11) so low resistance material is chosen, thus it is configured to carry a driving current of at least 50 mA of current.

Regarding claims 53, 54, the combined structure of Nagayama /Iyama/Codama teaches Mo-Nb alloy and Al alloy. Further, Codama specifically teaches that the protective layers in the interconnections should have thickness in the range of 100-500 nm in order to have optimum protection (lines 50-67 of column 8).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have layers in the range of 100-500nm, since such range of thickness of protecting layers will provide optimum protection.

Regarding claim 55, the combined structure of Nagayama/Iyama fails to disclose that the Al alloy contains Al-Nd.

However, Codama et al. in the analogous art teaches addition of transition metal such as Nb in the Al layer (col. 8 lines 39-47; col. 8 line 30). Additionally, Codama et al. teaches incorporation transition metal in the alloy improves protection property of the interconnecting of the thin film electrode (col. 8, lines 30-50).

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the Al alloy containing Nb in the auxiliary electrode of combined structure of Nagayama /Iyama, since such a modification would provide further protection of the interconnection electrode as taught by Codama et al.

Claims 11, 14-16, 21, 42-45, 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama (JP2000-243558) in view of Iyama (JP 09-138424), and further in view of Enomoto et al. (US 5543946).

Regarding claim 11, 14-16, 21, 42-45, 48-49, Nagayama teaches an organic EL (Fig 1-3 & 5) display element comprising a first conductive layer (9), a second a second conductive layer (5), made of transparent ITO, opposed to the first conductive layer 9, an insulating layer covering edge portions of the second conductive layer 5 (see paragraph 13) a driving current circuit (see paragraph 0003) connecting terminal connected electrically with the first electrode (9) via supplementary wire (16), and an organic EL layer (7) disposed between first and second conductive layer, such that the organic layer only contacts a central portion of the of a surface of the second conductive layer and does not contact the edge portions of the second conductor 5 (see Figs 6 & 8, where the edges of the anode 5 is not covered by organic EL layer 7, only the central portion of anode 5 is contacting organic EL layer 7; also see paragraph 13); wherein the supplementary layer has at least one surface layer containing Mo alloy (see paragraph 9), where the second conductive layer (5) is made of a same material (ITO) as the driving current circuit connecting terminal (15 is also made of ITO).

But Nagayama is silent about the supplemental wire (16) has a different composition from the remainder of the supplemental wire or supplemental wire comprises at least 3 layers including a layer containing Mo alloy, and a layer of Al or Al alloy formed below the Mo layer.

However, in the same field of display device, Iyama discloses wiring pattern for driving a display having a metal electrode comprising at least 3 layers (17, 18 & 19 of Fig 2f) first and third metal thin film layer made of Mo (17 & 19), a layer (18) of Al or Al alloy (second metal thin film layer) formed below the layer of Mo, on the transparent layer (16). Further Iyama teaches that such type of multilayer wiring extremely lower the occurrence rate of display defect by preventing erosion of transparent and metallic thin film electrode, (see English Abstract).

But the combined structure of Nagayama and Iyama fails to teach that the Mo alloy contains Nb or vanadiun (V) and further the content of Nb in case of Mo-Nb alloy is between 10 and 20 at%.

However, in the same field of display, Enomoto et al. disclose a laminated electrode having a Mo alloy layer containing either Nb or Vanadium, where content of Nb is between 10-20 at% (lines 22-31 of column 3; at% is calculated from wt%). Enomoto et al. further teach that such an amount of alloying element is highly suitable for controlling the etching speed.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use Mo-Nb or Mo-V alloy, where content of Nb in Mo-Nb alloy is between 10-20 at %, in the combined structure of Nagayama/Iyama, since such content of alloying material will provide accurate control of etching speed.

Response to Arguments

Applicant's arguments filed 4/10/2008 have been fully considered but they are not persuasive.

Applicant contends that Codama teaches content of transition metal Nb in the alloy is upto 10 at%, and further alleges that amounts greater than 10 at % apparently results in too high of a resistance.

In response, first of all examiner respectfully presents that 10 at% is included in claimed 10-20 at% range. Further Applicant's specification (page 33-34) specifically includes content of Nb being 10 at %.

Further, Codama in lines 46-49, states only that with the decrease of content of transition metal, resistance becomes lower, but does not state which amount will be considered too high of a

resistance for the interconnect. So such conclusion of addition of Nb greater than 10 at% would result too high of a resistance is not supported by those statements.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh-Toan Ton can be reached on 571-272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karabi Guharay/
Primary Examiner, Art Unit 2889